

Commonwealth of Kentucky
Division for Air Quality
STATEMENT OF BASIS / SUMMARY

Title V, Operating
Permit: V-20-017
Smithfield Packaged Meats Corp. - Grayson
Grayson, KY 41143
Ken Porter, Reviewer
SOURCE ID: 21-043-00038
AGENCY INTEREST: 725
ACTIVITY: APE20200001

Table of Contents

| | |
|---|-----------|
| SECTION 1 - SOURCE DESCRIPTION | 2 |
| SECTION 2 – CURRENT APPLICATION..... | 3 |
| SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS | 4 |
| SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS | 10 |
| SECTION 5 - PERMITTING HISTORY | 11 |
| SECTION 6 – PERMIT APPLICATION HISTORY: | 11 |
| APPENDIX A – ABBREVIATIONS AND ACRONYMS | 12 |
| APPENDIX B – INDIRECT HEAT EXCHANGER EMISSION LIMITATIONS..... | 12 |

SECTION 1 - SOURCE DESCRIPTION

SIC Code and description: 2013, Sausages and Other Prepared Meat Products (except lard made from purchased materials)

Single Source Det. ☐ Yes ☒ No If Yes, Affiliated Source AI:

Source-wide Limit ☒ Yes ☐ No If Yes, See Section 4, Table A

28 Source Category ☐ Yes ☒ No If Yes, Category:

County: Carter

Nonattainment Area ☒ N/A ☐ PM₁₀ ☐ PM_{2.5} ☐ CO ☐ NO_x ☐ SO₂ ☐ Ozone ☐ Lead

If yes, list Classification:

PTE* greater than 100 tpy for any criteria air pollutant ☒ Yes ☐ No

If yes, for what pollutant(s)?

☐ PM₁₀ ☐ PM_{2.5} ☒ CO ☐ NO_x ☐ SO₂ ☐ VOC

PTE* greater than 250 tpy for any criteria air pollutant ☒ Yes ☐ No

If yes, for what pollutant(s)?

☐ PM₁₀ ☐ PM_{2.5} ☒ CO ☐ NO_x ☐ SO₂ ☐ VOC

PTE* greater than 10 tpy for any single hazardous air pollutant (HAP) ☐ Yes ☒ No

If yes, list which pollutant(s):

PTE* greater than 25 tpy for combined HAP ☐ Yes ☒ No

*PTE does not include self-imposed emission limitations.

Description of Facility:

Smithfield Packaged Meats Corp. - Grayson (SPMC), is a meat packing and meat products manufacturing facility located in Grayson, Kentucky. Raw meats are stuffed and loaded into casings upstream of the cooking and smoking operations at the plant. The products are then loaded onto racks for processing in one of the batch ovens with smoker unit. The facility consists of 10 meat smokehouses that are used to add flavor, color and aroma to meat products and each smokehouse is associated with smokers.

SECTION 2 – CURRENT APPLICATION

Permit Number: V-20-017

Activity: APE20200001

Received: January 30, 2020

Application Complete Date(s): April 27, 2020

Permit Action: ☒ Initial ☐ Renewal ☐ Significant Rev ☐ Minor Rev ☐ Administrative
Construction/Modification Requested? ☐ Yes ☒ No NSR Applicable? ☐ Yes ☒ No

Description of Action:

On January 30, 2020, the Division received an application from Smithfield Packaged Meats Corp. – Grayson for the renewal of the state-origin permit along with a request to obtain a Title V permit due to the potential emissions of carbon monoxide pollutant greater than major source threshold, based on updates to CO emission factor from the smoke generator units.

| V-20-017 Emission Summary | | |
|---------------------------------|-------------------|-----------------------|
| Pollutant | 2019 Actual (tpy) | PTE V-20-017 (tpy) |
| CO | 9.92 | 150.66 |
| NO _x | 5.66 | 38.50 |
| PT | 0.43 | 1.07 |
| PM ₁₀ | 0.53 | 1.07 |
| PM _{2.5} | 0.42 | 0.87 |
| SO ₂ | 0.05 | 2.04 |
| VOC | 0.52 | 5.68 |
| Lead | 0.00003 | 0.00019 |
| Greenhouse Gases (GHGs) | | |
| Carbon Dioxide | 7,269.66 | 46,205.91 |
| Methane | 0.20 | 1.06 |
| Nitrous Oxide | 0.13 | 0.85 |
| CO ₂ e: | 7,313.40 | 46,484.87 |
| Hazardous Air Pollutants (HAPs) | | |
| Formaldehyde | 0.004 | 0.029 |
| Combined HAPs: | 0.004 | 0.029 |

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS

| Emission Units: EU01 & EU02 Two Indirect Heat Exchanger 10.46 MMBtu/hr (each) | | | | |
|---|---|--|--|---|
| Pollutant | Emission Limit or Standard | Regulatory Basis for Emission Limit or Standard | Emission Factor Used and Basis | Compliance Method |
| PM | 20% Opacity, except max. 40% opacity for not more than six (6) minutes in any sixty (60) consecutive minutes during cleaning the fire box or blowing soot | 401 KAR 59:015, Section 4(2) and 401 KAR 59:015, Section 4(2)(b) | 0.52 lb/MMscf EPA 2014 National Emission Inventory Ver.2 Tech Support Doc. July 2018 Table 4 - 69 | These units are assumed to be in compliance with the allowable PM, opacity, and SO ₂ limitations while burning natural gas |
| | 0.43 lb/MMBtu | 401 KAR 59:015, Section 4(1)(c) | | |
| SO ₂ | 1.93 lb/MMBtu | 401 KAR 59:015, Section 5(1)(c)2.b | 0.6 lb/MMscf AP-42 Table 1.4-2 | |
| Process Description: | | | | |
| Emission Units: | Maximum Continuous Rating | Manufacturer | Primary Fuel | Construction Commenced |
| EU01 & EU02 | 10.46 MMBtu/hr (each) | Kewanee, Model: H35-250 | Natural Gas | 1991 |
| <p>Applicable Regulation: 401 KAR 59:015, New indirect heat exchangers</p> <p>401 KAR 60:005, Section 2(2)(d), 40 C.F.R. 60.40c to 60.48c (Subpart Dc), Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.</p> <p>Comments: For detailed emission limit calculations, see Appendix B – Indirect Heat Exchanger Emission Limitations</p> <p>The particulate emissions factors have been updated using the values from EPA 2014 National Emissions Inventory Ver. 2 Tech Support Doc. July 2018</p> <p>Steam generated by the natural gas fired boilers are used to maintain the temperature and humidity within the chamber of the smokehouses.</p> | | | | |

| Emission Units: EU03 & EU04 Two Indirect Heat Exchangers | | | | |
|--|---|--|--|---|
| Pollutant | Emission Limit or Standard | Regulatory Basis for Emission Limit or Standard | Emission Factor Used and Basis | Compliance Method |
| PM | 20% Opacity, except max. 40% opacity for not more than six (6) minutes in any sixty (60) consecutive minutes during cleaning the fire box or blowing soot | 401 KAR 59:015, Section 4(2) and 401 KAR 59:015, Section 4(2)(b)] | (Natural Gas) 0.52 lb/MMscf EPA 2014 National Emission Inventory Ver.2 Tech Support Doc. July 2018 Table 4 – 69 | These units are assumed to be in compliance with the allowable PM, opacity, and SO ₂ limitations while burning natural gas |
| | 0.43 lb/MMBtu | 401 KAR 59:015, Section 4(1)(c) | (Biogas) 17 lb/MMscf AP 42 2.4-5 | |
| SO ₂ | 1.93 lb/MMBtu | 401 KAR 59:015, Section 5 (1) (a) 1. and 401 KAR 59:015, Section 5(1)(c)2.b. | (Natural Gas) 0.6 lb/MMscf AP-42 Table 1.4-2 (Biogas) 84.35 lb/MMscf 2018 Biogas Analysis | |
| Process Description: | | | | |
| Emission Unit | Maximum Continuous Rating | Manufacturer | Primary Fuel | Construction Commenced |
| EU03 | 4.16 MMBtu/hr | Kewanee, Model: H3S-100-G | Natural Gas | 1991 |
| EU04 | 4.19 MMBtu/hr | York Shipley, Model: 560C - H3D -100-W030-NM 14-22810 | Natural Gas/Biogas | 2014 |
| Applicable Regulation: 401 KAR 59:015, New indirect heat exchangers | | | | |
| Comments: For detailed emission limit calculations, see Appendix B – Indirect Heat Exchanger Emission Limitations | | | | |
| Steam generated by the natural gas fired boilers are used to maintain the temperature and humidity within the chamber of the smokehouses, | | | | |
| In 2014 an existing 4.16 MMBtu/hr biogas / natural gas boiler, (EU04) was replaced with a 4.19 MMBtu/hr biogas / natural gas boiler. The biogas is produced at the anaerobic treatment basin and has a heat content of 848.7Btu/scf calculated from average of five (5) biogas samples. SO ₂ emissions for biogas are based on a 2018 biogas analysis. NO _x , CO and PM emissions are based on AP-42 Table 2.4-5 for combustion of biogas. For natural gas, the particulate emissions factors have been updated from EPA 2014 National Emissions Inventory Ver. 2 Tech Support Doc. July 2018. | | | | |

| Emissions Units: EU05 – EU14 | | | | | 10 Batch Smokehouse Ovens | | | | |
|---|--|----------------------------------|--|---|---------------------------|--|--|--|--|
| Pollutant | | Emission Limit or Standard | | Regulatory Basis for Emission Limit or Standard | | Emission Factor Used and Basis | | Compliance Method | |
| PM | | 20% Opacity | | 401 KAR 59:010, Section 3(1)(a) | | 0.52 lb/MMscf EPA 2014 National Emission Inventory Ver.2 Tech Support Doc. July 2018 Table 4 - 69 | | These units are assumed to be in compliance with the allowable PM limitation while burning natural gas | |
| | | 2.34 lb/hr | | 401 KAR 59:010, Section 3(2), and 401 KAR 59:010, Section 5, Appendix A | | | | | |
| Process Description for Emission Units: EU05 – EU14 | | | | | | | | | |
| Rated Capacity (MMBtu/hr) | | Process Throughput (lbs meat/hr) | | Manufacturer | | Control Device | | Construction Commenced | |
| 4.0 lb/hr (each) | | 4,400 (each) | | Alkar | | Wet Scrubber | | 1991 | |
| <p>There are ten batch smokehouse ovens. All ovens, (EU05 – EU14) are equipped with natural gas burners each having a rated heat input capacity of 4.0 MMBtu/hr each. In the batch smokehouses, meat products are loaded into the cooking chamber using specially designed racks known as “trees”. The temperature and humidity within the chamber are controlled using heat generated by the natural gas fired burners and steam produced by the natural gas and biogas fired boilers. Natural wood smoke can be injected into the batch smokehouses. Emissions from each batch smokehouse are routed through scrubber and stack to the atmosphere.</p> <p>Applicable Regulation: 401 KAR 59:010, <i>New process operations</i></p> <p>State-Origin Requirements: 401 KAR 63:020, <i>Potentially hazardous matter or toxic substances</i></p> <p>Comments: 401 KAR 59:010, Section 2(2) defines “process weight” as “the total weight of all materials introduced into any affected facility which may cause any emission of particulate matter, but does not include liquid and gaseous fuels charged, combustion air, or uncombined water”. Particulate matter emissions from the ovens comes solely from natural gas combustion (i.e., the meat processed does not contribute to particulate matter emissions from the ovens). As such, the meat processed by the ovens is not considered in determining the process weight rate for 401 KAR 59:010 as it does not meet the 401 KAR 59:010, Section 2(2) definition. Similarly, the mass of natural gas and combustion air are not considered in determining the process weight rate. Therefore, the process weight rate for the ovens is 0 lb/hr, corresponding to a maximum allowable particulate matter emission rate of 2.34 lb/hr.</p> <p>There are typically 2 batches per day with cooking batch times being 12 – 13 hours.</p> | | | | | | | | | |

| Emissions Units: EU5WS – EU14WS | | | 10 Smoke Generator Units | |
|--|----------------------------------|---|--|--|
| Pollutant | Emission Limit or Standard | Regulatory Basis for Emission Limit or Standard | Emission Factor Used and Basis | Compliance Method |
| PM | 20% Opacity | 401 KAR 59:010, Section 3(1)(a) | 0.52 lb/MMscf EPA 2014 National Emission Inventory Ver.2 Tech Support Doc. July 2018 Table 4 - 69 | Compliance demonstrated with monitoring and recordkeeping requirements |
| | 2.34 lb/hr | 401 KAR 59:010, Section 3(2), and 401 KAR 59:010, Section 5, Appendix A | | |
| Process Description for Emission Units: EU5WS – EU14WS | | | | |
| Rated Capacity (wood) | Process Throughput (lbs meat/hr) | Manufacturer | Control Device | Construction Commenced |
| 26 lb/hr (each) | 4,400 (each) | Friedrich, Model: NS-80-1 | Wet Scrubber | 2009 |
| Natural wood smoke is produced in the smoke generator by heating wood and sent to the associated smokehouse oven. | | | | |
| Applicable Regulation: 401 KAR 59:010, <i>New process operations</i> | | | | |
| State-Origin Requirements: 401 KAR 63:020, <i>Potentially hazardous matter or toxic substances</i> | | | | |
| Emission and Operating Caps The permittee shall not exceed 280 ton/yr of wood on a rolling twelve (12) month total used for the smoke generator units [to preclude applicability of 401 KAR 51:017] | | | | |
| Comments: Emission limitation based on the amount of wood fuel (sawdust/hardwood chips) used. The permittee shall monitor the amount of wood fuel (sawdust/hardwood chips) used. Max Run Time: (4 hr/batch)(2 batches/day)(6 day/week)(52 weeks/year)=2,496 hr/year (for each smoke generator) Max Rated Capacity: 26 lb/hr (each) The smoke generators do not run at maximum capacity but , each smoke generator uses 10 – 14 lbs. wood/hour. | | | | |

| Emission Unit: EU15 Flare | | | | |
|---|----------------------------|---|--------------------------------|--|
| Pollutant | Emission Limit or Standard | Regulatory Basis for Emission Limit or Standard | Emission Factor Used and Basis | Compliance Method |
| PM | 20% Opacity | 401 KAR 63:015, Section 3 | 17.0 lb/MMscf AP-42 2.4-5 | Compliance demonstrated with monitoring and recordkeeping requirements |
| Process Description: | | | | |
| Emission Unit | Rated Capacity (MMBtu/hr) | Manufacturer | Fuel | Construction Commenced |
| EU15 | 4.16 | Varec, Model: 244W | Biogas | 1991 |
| <p>Applicable Regulation: 401 KAR 63:015, <i>Flares</i></p> <p>Comments: Particulate matter from any flare can not be greater than twenty (20) percent opacity for more than three (3) minutes in any one (1) day.</p> <p>SO₂ emissions are based on a 2018 biogas analysis. CO₂, CH₄, and N₂O emissions are based on annual emissions inventories 2010 – 2013.</p> <p>The FLARE is to only operate when the emission unit 04, (EU04) is down for service.</p> | | | | |

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS (CONTINUED)

Testing Requirements\Results

| Emission Unit(s) | Control Device | Parameter | Regulatory Basis | Frequency | Test Method | Permit Limit | Test Result | Thruput and Operating Parameter(s) Established During Test | Activity Graybar | Date of last Compliance Testing |
|------------------|----------------|-----------|---|-----------|-------------|--------------|-------------|--|------------------|---------------------------------|
| Smokehouse #2 | Wet Scrubber | PM | 401 KAR 59:010, Section 3(2), and 401 KAR 59:010, Section 5, Appendix A | N/A | Method 5 | 5.89 lb/hr | 0.171 lb/hr | Process Rate/Load 40000 lbs | CMN20110004 | 9/08/11 |
| Smokehouse #2 | Wet Scrubber | VOC | | N/A | Method 25 | N/A | 0.42 lb/hr | Process Rate/Load 40000 lbs | CMN20110004 | 9/08/11 |

Footnotes:

Comment from the tester. “Protocol stated that Smokehouse number 2 would be tested. I did not see smokehouse #2 in the permit, so I am not sure which EU this is. The listed process rate is for a 13-hour cycle.”

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS

Table A - Group Requirements:

| Emission and Operating Limit | Regulation | Emission Unit |
|--|----------------------------|-----------------|
| 280 tons/yr of wood used by the smoke generators | To Preclude 401 KAR 51:017 | EU05WS – EU14WS |

Table B - Summary of Applicable Regulations:

| Applicable Regulations | Emission Unit |
|--|---------------------------------|
| 401 KAR 63:020, <i>Potentially hazardous matter or toxic substances.</i> | EU05 – EU14, EU05WS – EU14WS |
| 401 KAR 59:015, <i>New indirect heat exchangers.</i> | EU01, EU02, EU03, EU04 |
| 401 KAR 60:005, Section 2(2)(d) 40 C.F.R. 60.40c to 60.48c (Subpart Dc) <i>Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units</i> | EU01, EU02 |
| 401 KAR 59:010, <i>New process operations.</i> | EU05 – EU14, EU05WS – EU14WS |
| 401 KAR 63:015, <i>Flares.</i> | EU15 |

Table C - Summary of Precluded Regulations:

N/A

Table D - Summary of Non Applicable Regulations:

N/A

Air Toxic Analysis

401 KAR 63:020, *Potentially Hazardous Matter or Toxic Substances*

The Division has performed SCREEN View on April 6, 2020 of potentially hazardous matter or toxic substances that may be emitted by the facility based upon the process rates, material formulations, stack heights and other pertinent information provided by the applicant. Based upon this information, the Division has determined that the conditions outlined in this permit will assure compliance with the requirements of 401 KAR 63:020.

Single Source Determination

N/A

SECTION 5 - PERMITTING HISTORY

| Permit | Permit type | Activity# | Complete Date | Issuance Date | Summary of Action | PSD/Syn Minor |
|-------------|---------------------------|-------------|---------------|---------------|--------------------------------------|---------------|
| S-10-069 | Initial | APE20100001 | 05/08/2010 | 07/28/2010 | Initial Permit | N/A |
| S-10-069 R1 | Minor Revision | APE20100004 | 10/07/2010 | 12/15/2010 | Addition of three Roof Vents | N/A |
| S-10-069 R2 | Minor Revision | APE20110001 | 12/29/2011 | 01/06/2012 | Addition of Insignificant Activities | N/A |
| S-10-069 R3 | Administration. Amendment | APE20140002 | 07/07/2014 | 07/14/2014 | Name Change | N/A |
| S-10-069 R4 | Minor Revision | APE20140003 | 07/22/2014 | 08/17/2014 | Replace Biogas Boiler | N/A |
| S-10-069 R5 | Administration. Amendment | APE20180001 | 02/12/2018 | 04/01/2018 | Name Change | N/A |

SECTION 6 – PERMIT APPLICATION HISTORY:

N/A

APPENDIX A – ABBREVIATIONS AND ACRONYMS

| | |
|-------------------|---|
| Btu | – British thermal unit |
| CO | – Carbon Monoxide |
| Division | – Kentucky Division for Air Quality |
| GHG | – Greenhouse Gas |
| HAP | – Hazardous Air Pollutant |
| HF | – Hydrogen Fluoride (Gaseous) |
| MSDS | – Material Safety Data Sheets |
| mmHg | – Millimeter of mercury column height |
| NO _x | – Nitrogen Oxides |
| PM | – Particulate Matter |
| PM ₁₀ | – Particulate Matter equal to or smaller than 10 micrometers |
| PM _{2.5} | – Particulate Matter equal to or smaller than 2.5 micrometers |
| PTE | – Potential to Emit |
| SO ₂ | – Sulfur Dioxide |
| TF | – Total Fluoride (Particulate & Gaseous) |
| VOC | – Volatile Organic Compounds |

APPENDIX B – INDIRECT HEAT EXCHANGER EMISSION LIMITATIONS

| Name | Construction Date | Date Replaced | Capacity <i>MMBtu/hr</i> | Total for Year (T) <i>MMBtu/hr</i> | PM Limit (E _P)* <i>lb/MMBtu</i> | SO ₂ Limit (E _S)** <i>lb/MMBtu</i> |
|------|-------------------|---------------|-----------------------------|--|---|---|
| EU01 | 1991 | N/A | 10.46 | 29.24 | 0.43 | 1.93 |
| EU02 | 1991 | | 10.46 | | | |
| EU03 | 1991 | | 4.16 | | | |
| EU04 | 1991 | 2014 | 4.16 | 29.27 | 0.43 | 1.93 |
| EU04 | 2014 | N/A | 4.19 | | | |

* $E_P = 0.9634 (T^{-0.2356})$

** $E_S = 7.7223 (T^{-0.4106})$